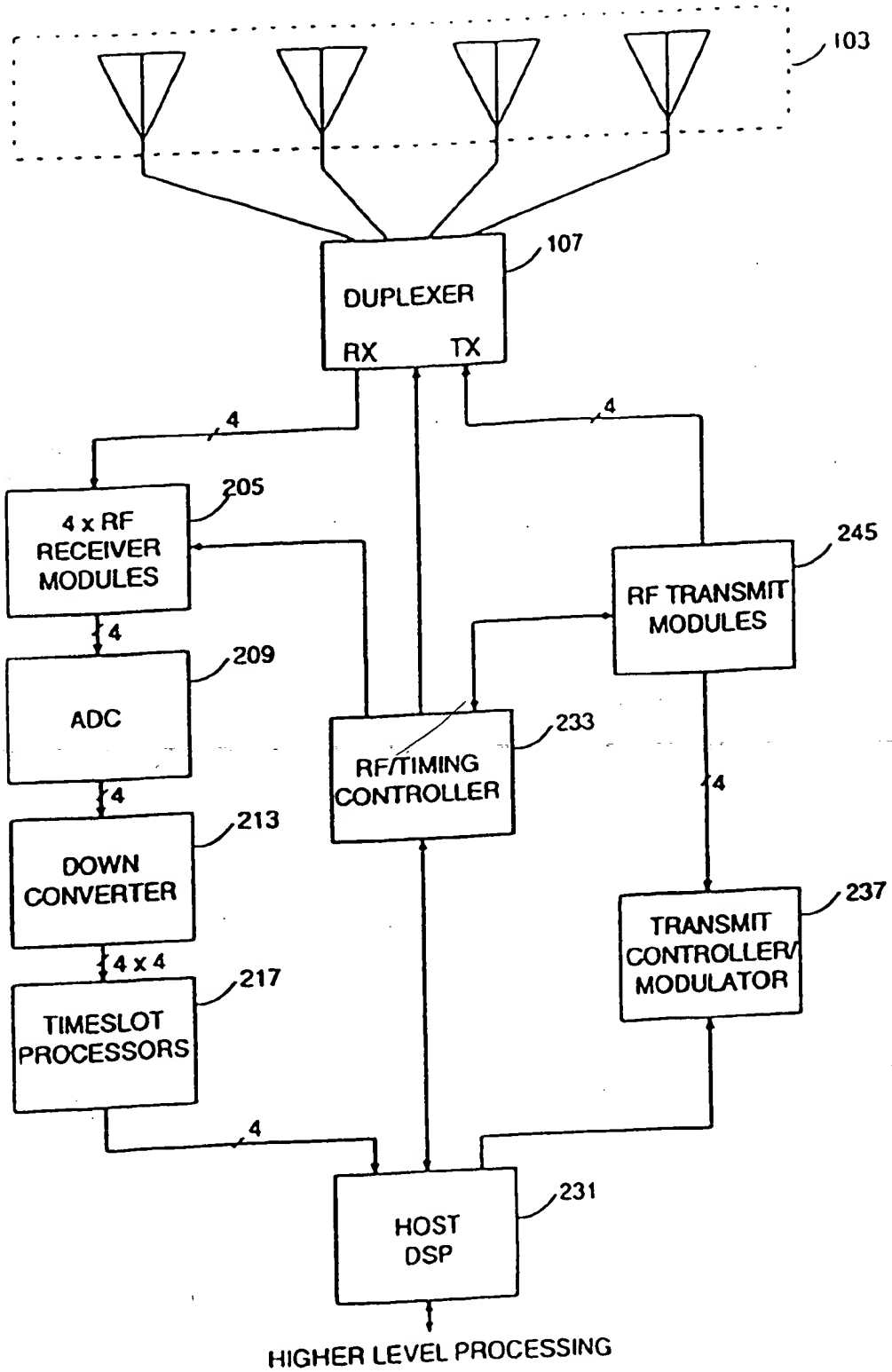
103
107
DUPLEXER
RX
TX
4
4
205
4 x RF
RECEIVER
MODULES
245
RF TRANSMIT
MODULES
4
209
ADC
233
RF/TIMING
CONTROLLER
4
4
213
DOWN
CONVERTER
237
TRANSMIT
CONTROLLER/
MODULATOR
4 x 4
217
TIMESLOT
PROCESSORS
4
231
HOST
DSP
HIGHER LEVEL PROCESSING

Figure 1

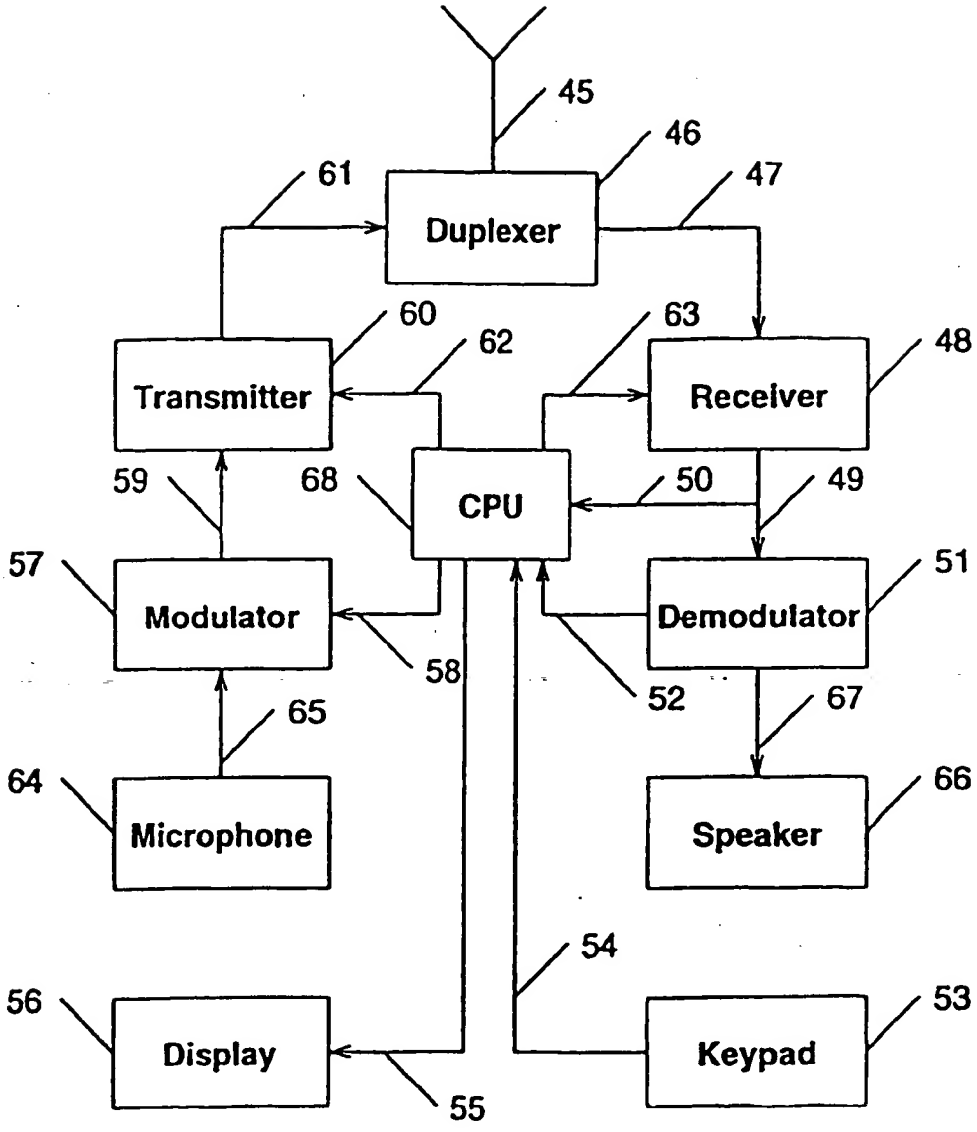
45
46
61
47
Duplexer
60
62
63
48
Transmitter
Receiver
59
68
CPU
50
49
57
Modulator
58
Demodulator
51
52
65
67
64
Microphone
Speaker
66
54
56
Display
Keypad
53
55

FIG. 2

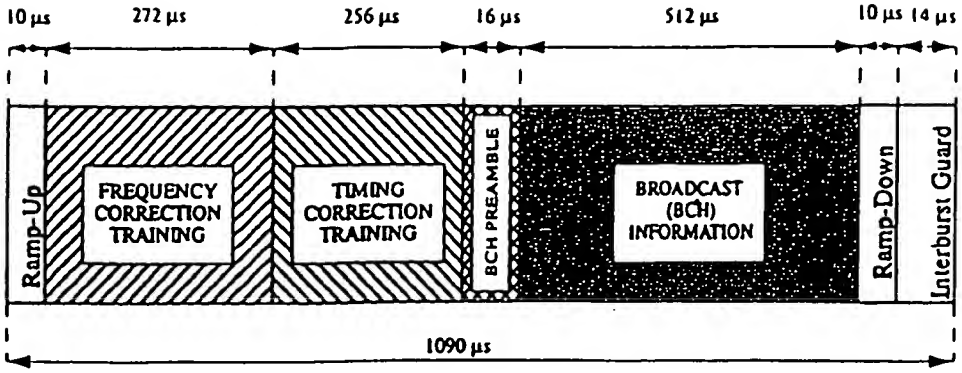
10 µs
272 µs
256 µs
16 µs
512 µs
10 µs
14 µs
Ramp-Up
FREQUENCY CORRECTION TRAINING
TIMING CORRECTION TRAINING
BCH PREAMBLE
BROADCAST (BCH) INFORMATION
Ramp-Down
Interburst Guard
1090 µs

Fig. 3

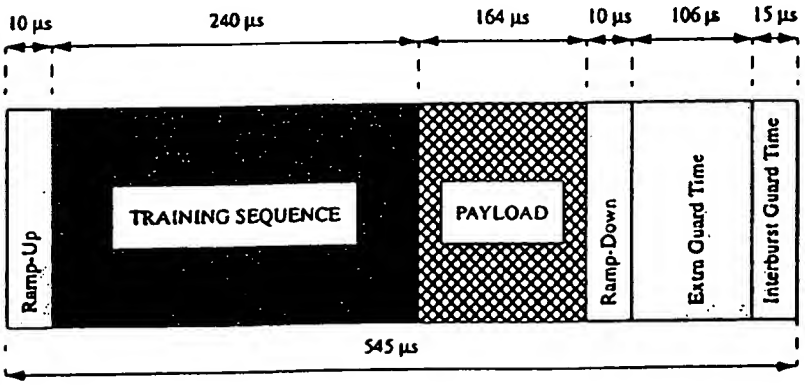
10 µs
240 µs
164 µs
10 µs
106 µs
15 µs
Ramp-Up
TRAINING SEQUENCE
PAYLOAD
Ramp-Down
Extra Guard Time
Interburst Guard Time
545 µs

Fig. 4

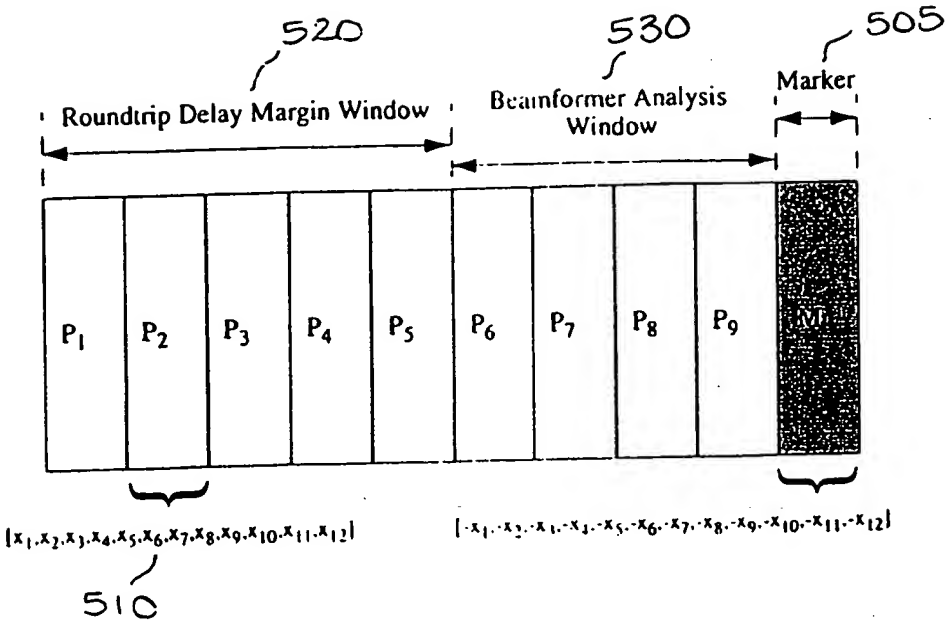
520
530
505
Roundtrip Delay Margin Window
Beamformer Analysis Window
Marker
P1
P2
P3
P4
P5
P6
P7
P8
P9
M
[x1,x2,x3,x4,x5,x6,x7,x8,x9,x10,x11,x12]
[-x1,-x2,-x3,-x4,-x5,-x6,-x7,-x8,-x9,-x10,-x11,-x12]
510

Fig. 5

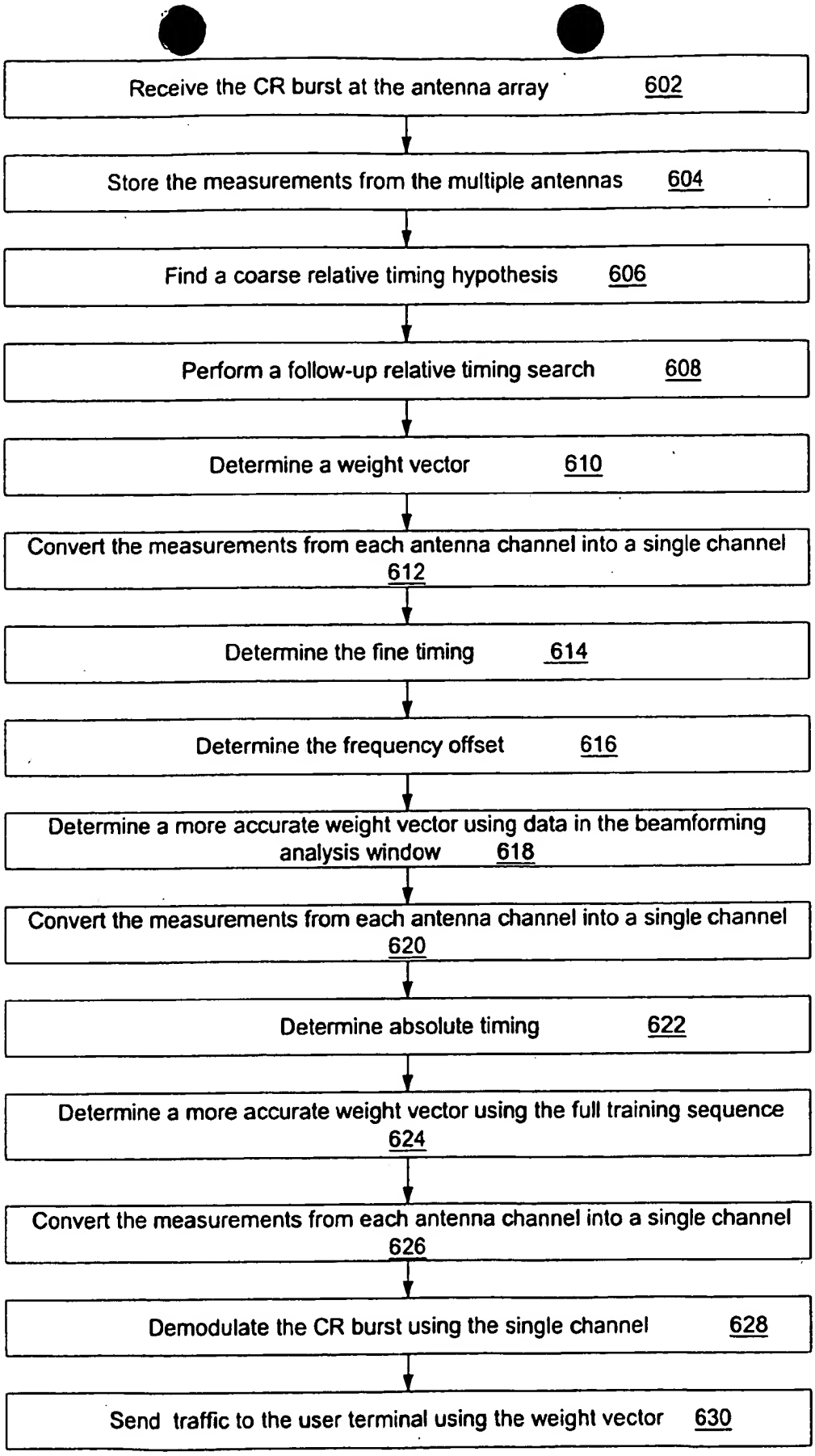
Receive the CR burst at the antenna array 602
Store the measurements from the multiple antennas 604
Find a coarse relative timing hypothesis 606
Perform a follow-up relative timing search 608
Determine a weight vector 610
Convert the measurements from each antenna channel into a single channel 612
Determine the fine timing 614
Determine the frequency offset 616
Determine a more accurate weight vector using data in the beamforming analysis window 618
Convert the measurements from each antenna channel into a single channel 620
Determine absolute timing 622
Determine a more accurate weight vector using the full training sequence 624
Convert the measurements from each antenna channel into a single channel 626
Demodulate the CR burst using the single channel 628
Send traffic to the user terminal using the weight vector 630

Figure 6

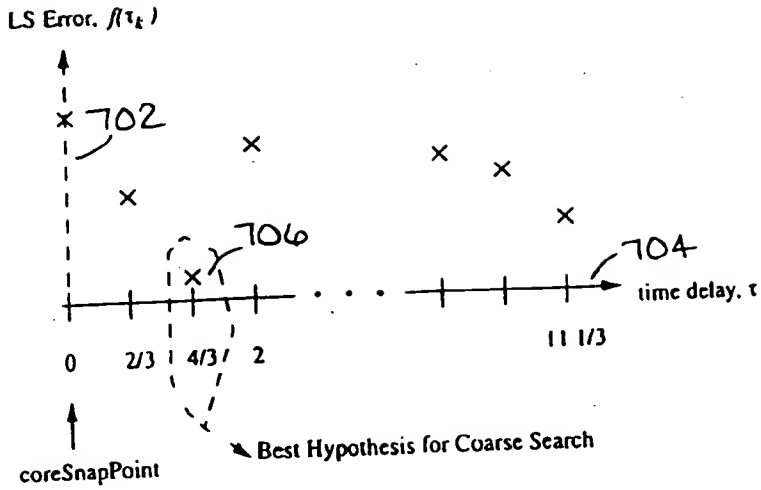
LS Error. $f(\tau_k)$
702
706
704
time delay. τ
0
2/3
4/3
2
11 1/3
coreSnapPoint
Best Hypothesis for Coarse Search

Fig. 7

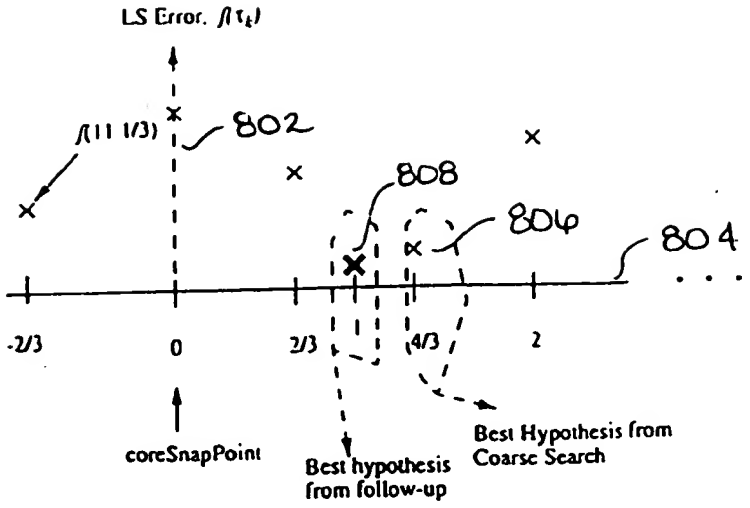
LS Error, $f(\tau_k)$
f(1 1/3)
802
808
806
804
-2/3
0
2/3
4/3
2
coreSnapPoint
Best hypothesis from follow-up
Best Hypothesis from Coarse Search

Fig. 8